Assignment #1: Problem formulation for farming problem

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Maskininlärning och optimering

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Variables:

x = hectares of wheat

y = hectares of barley

Function

The objective is to maximize the total revenue from planting the crops. The know factors are that wheat produces $200 per hectare and barley produces $300 per hectare, this results in the following function:

$$Maximize\ Z = 200x + 300y$$

Constraints

1. Area: The total hectares of *x* and *y* cannot surpass 10 hectares:

   Constraint: A $x + y \leq 10$

2. Labor: Total labor for both crops cannot exceed combined labor which is 70h/week:

   Constraint: B $8x + 10y \leq 70$

3. Water: Water usage cannot exceed the maximum amount of available water per day:

   Constraint: C $6x + 9y \leq 65$

4. Preference: The spouse has presented an optional wish of planting 3.5 hectares of wheat and 2.5 hectares of barley; this is not a strict constraint:

   Constraint: D $x \geq 3.5\ (Optional) \quad and \quad y \geq 2.5$ *(Optional)*

5. Non-negativity: The number of hectares planted cannot be negative:

   Constraint: A $x \geq 0 \quad and \quad y \geq 0$